REMARKS/ARGUMENTS

Claim Status – Request for Reconsideration and Restriction

Reconsideration of this application is requested. The claims presented for reconsideration are claims 1, 3, 4, 6-9, 16-25, 27-31, 35-43, and 104-105, as amended.

Claims 64-80 and 100-103, which were previously withdrawn, have been canceled in response to the restriction requirement. Applicants reserve the right to prosecute the subject matter of those claims by way of a divisional application.

Claim 1 has been amended to include the limitations of now canceled claims 2 and 5. Both claims 1 and 24 have been amended consistent with the description in the specification at paragraphs [0015], [0039], [0050], and [0052]-[0053].

Claims 104 and 105 are newly added. These claims include a specific step of analyzing the solution or suspension of aluminum-containing precursor by ^{27}Al NMR spectroscopy to determine the atom% of the aluminum in the precursor. This limitation is consistent with the description in the specification at paragraphs [00198] and [00205]-[00208]. The amendments to the claims, therefore, introduce no new matter.

Claim Objections

Claims 10, 16, 21, 26, 30, 32, 36, 41, 50, 52, 56, 61, 85, and 89-92 were objected to due to the use of "preferable" ranges. Those claims having been corrected or canceled renders this objection moot.

Claim Rejections - 35 U.S.C § 112

Claims 1-23 were rejected for use of the term "sharp." Those claims having also been corrected or canceled, this rejection is moot.

Claim Rejections – 35 USC § 102

Claims 1-63 and 82-103 were rejected under 35 USC § 102(e) as being anticipated by U.S. Patent Publication No. 2003/0187312 (Chang) and under 35 USC § 102(b) as being anticipated by U.S. Patent No. 4,837,396 (Herbst). These rejections are traversed and reconsideration is requested.

This invention is directed to making molecular sieve catalyst particles that are highly attrition resistant. The claimed methods include the use of a solution or suspension of an aluminum-containing inorganic oxide precursor in which at least 6 atom% of the aluminum in the precursor is in a form exhibiting an ^{27}Al NMR peak at 62-63 ppm. In one embodiment, the solution or suspension of aluminum-containing precursor is analyzed by ^{27}Al NMR spectroscopy to determine the atom% of the aluminum in the precursor. Using this solution to make a catalyst slurry, and then forming catalyst particles from that slurry, can advantageously result in catalyst particles that are highly attrition resistant.

Chang discloses a method of making a molecular sieve catalyst. In Example 2, the method incorporates a step of making a sol of aluminum chlorohyrate from aluminum cholorhydrate powder. The sol is then added to a slurry containing molecular sieve, along with kaolin clay. The components were mixed and then aged at 40°C for 15 hours.

Chang differs from the claimed invention in that Chang does not inherently provide a solution or suspension of an aluminum-containing inorganic oxide precursor in which at least 6 atom% of the aluminum in the precursor is in a form exhibiting an ^{27}Al NMR peak at 62-63 ppm, mix that solution with molecular sieve, and then form molecular sieve particles. Chang certainly does not disclose or suggest an analysis step using ^{27}Al NMR, as recited in claims 104-105.

As shown in Fig. 1 of this application, solutions can be prepared that have very little aluminum in the precursor material that exhibits an ^{27}Al NMR peak at 62-63 ppm. For example, Solution (A) is one in which only about 4 atom% of the aluminum in the precursor is in a form exhibiting an ^{27}Al NMR peak at 62-63 ppm. At the higher percentage in the 6 atom% range, as exemplified by Solution (B), the solution can be used to make a slurry, and ultimately catalyst particles, that are highly attrition resistant. This can be done without having to "age" the slurry prior to particle formation. There is nothing in Chang that suggests the importance of the type of aluminum in the solution. Chang only generally discloses a broad range of mixing conditions for the aluminum solution and does not show or suggest that differences in the type of aluminum in the solution could lead to such a benefit. This is something that is unexpected, and demonstrated only in this application.

Herbst discloses making zeolite molecular sieve catalyst using aluminum chlorohydrate. Herbst, however, generally mixes the zeolite with the aluminum chlorohydrate powder and then forms a solution. See, e.g., Example 2. This is significantly different from the claimed method in which a solution or suspension of an aluminum-containing inorganic oxide precursor is provided in which at least 6 atom% of the aluminum in the precursor is in a form exhibiting an ^{27}Al NMR peak at 62-63 ppm; then using that solution to make a catalyst slurry; and then forming catalyst particles from the slurry. Those steps are not disclosed or suggested by Herbst. Further, similarly to Chang, Herbst does not disclose or suggest an analysis step using ^{27}Al NMR, as recited in claims 104-105.

CONCLUSION

Having demonstrated that the cited references fail to disclose or suggest the invention as claimed, and all other formal issues having now been fully addressed, this application is in condition for allowance. Accordingly, Applicants request early and favorable reconsideration in the form of a Notice of Allowance.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1712 (Docket #: 2003B096).

Respectfully submitted,

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